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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------------------------|-------------|----------------------|---------------------|------------------|
| 10/671,978 | 09/26/2003 | Yehiel Gotkis | LAM2P438 | 8865 |
| 25920 | 7590 | 02/16/2006 | EXAMINER | |
| MARTINE PENILLA & GENCARELLA, LLP | | | DAVIS, OCTAVIA L | |
| 710 LAKEWAY DRIVE | | | ART UNIT | |
| SUITE 200 | | | PAPER NUMBER | |
| SUNNYVALE, CA 94085 | | | 2855 | |

DATE MAILED: 02/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/671,978

Applicant(s)

GOTKIS ET AL.

Examiner

Octavia Davis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/18/06.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see pages 6 to 8, filed 1/18/06, with respect to the rejections of claims 1 - 13 under Redeker et al and Lehman et al have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, new grounds of rejections are made in view of Chen and Boggs et al.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 - 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen (2005/0118839).

Regarding claim 1, Chen discloses a chemical mechanical polish process control method using thermal imaging of a polishing pad comprising a wafer carrier 11 supporting a wafer 12 during a planarization process, the wafer carrier including a sensor 22 detecting a signal indicative of a stress experienced by the wafer, a computing device (See Section 0039, lines 21 – 42) in communication with the sensor 22, the computing device translating the signal to generate a stress map and a stress

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relief device 16, 18 responsive to the signal (See Section 0033, lines 21 – 36 and Section 0039, lines 21 – 42) and the stress relief device 16, 18 including a fluid supply 21 which applies a fluid through a conduit 20 to a top surface of a slurry substantially uniformly disposed over a polishing pad 19 of the CMP system (See Section 0033, lines 14 – 21, See Fig. 1A).

Regarding claims 2 and 3, the sensor 22 is a temperature infrared sensor (See Section 0033, lines 20 – 23).

Regarding claim 4, the temperature controlled reservoir 21 applies an abrasive fluid curtain to the slurry, to polish the slurry, upstream from the conduit 20 (See Fig. 1).

Regarding claim 5, the polishing platen 16 is capable of applying a corrective action to relieve a stress mounted for continuous rotation about axis A2 (See Section 0034).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6 - 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen in view of Boggs et al.

Regarding claims 6 and 10, Chen discloses all of the limitations of these claims except for a teaching that the wafer carrier includes a plurality of sensors with a sensor being embedded in the wafer carrier. However, Boggs et al disclose a piezo-actuated cmp carrier comprising a wafer carrier

14 that includes a piezoelectric insert layer 18 therein that utilizes a plurality of thin film, dual-function piezoelectric actuators 41 – 42 (See Col. 3, lines 61 – 64 and Col. 4, lines 28 – 43).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Chen according to the teachings of Boggs et al for the purpose of, utilizing a control system to read pressure variations, sensed by actuators during a polishing process, across a wafer and compensating for pressure variations by activating the actuators to obtain a uniform pressure distribution across the wafer (See Boggs et al, Col. 5, lines 4 – 14).

Regarding claim 7, in Chen, the computing device calculates variations in temperature polishing pad uniformity (See Section 0039, lines 19 – 30).

Regarding claims 8 and 11, in Chen, the wafer carrier 11 rotatably supports the wafer 12 over the polishing pad 19 (See Section 0033, lines 7 – 17).

Regarding claim 9, in Chen, the fluid supply system 21 includes a nozzle 20 for delivering the fluid (See Fig. 1A).

Regarding claims 12 and 13, in Chen, the stress relief device includes a drive motor 14 that is capable of reducing one of a rotational speed of the wafer carrier and a linear velocity of the polishing pad and a platen 16 (See Section 0033, lines 7 – 14).

Claim Rejections - 35 USC § 103

6. Applicant's arguments with respect to these claims have been considered but are moot in view of the new grounds of rejection.

Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gotkis et al (6,540,587) disclose an infrared end-point detection system.

Lin et al (6,033,987) disclose a method for mapping and adjusting pressure distribution of a cmp process.

Yu et al (5,240,552) disclose a chemical mechanical planarization of a semiconductor wafer using acoustical waves for in-situ end point detection.

Chen (5,985,093) discloses a chemical planarization polish pad conditioner.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Octavia Davis whose telephone number is 571-272-2176. The examiner can normally be reached on Mon through Thurs from 9 to 5. The examiner can also be reached on alternate Fridays.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz, can be reached on ***. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



OD/2855

2/13/06



MAX NOORI
PRIMARY EXAMINER